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### Tubeless Gastric Analysis

The recent availability of cation-exchange indicator compounds has suggested their use in determining the presence or absence of free hydrochloric acid in gastric contents without intubation of the stomach. The purpose of this preliminary report is to present the authors' experiences with this test in comparison with the conventional tube method of gastric analysis, and to outline the indications and limitations of the tubeless technic.

The quininium resin indicator compound was administered orally in a 2 gm. dose of granules (containing 36 mg. of available quinine) to the patient after an overnight fast and after stimulation of the parietal cells of the stomach with histamine, 7% alcohol, or caffeine sodium benzoate. A control sample of urine and specimens voided 1 and 2 hours after the administration of the resin were collected and examined for quinine content by measure of their fluorescent intensity against standard solutions under ultraviolet light. The amount of quinine present was graded from 0 to + + + +. The determination of free acidity in the samples of gastric juice obtained by the conventional method of fractional gastric analysis was performed by titration with Töpfer's reagent and phenolphthalein in the usual manner. Because of urgent clinical considerations and active symptoms, several of the patients in this study did not fast the full 10 hours, and a number did not receive any parietal-cell stimulant. In no case was the validity of the quinine-excretion test compromised by this deviation from the standard technic.

Free hydrochloric acid is present in the gastric contents if more than 25 micrograms of quinine is found in the urine sample. Readings of less than 15 micrograms are reported as negative, and those of from 15 to 25 micrograms as a trace. The test may be repeated after 5 days.

The technic described was utilized in 58 examinations on 54 patients, equally divided between men and women, the ages ranging from 23 to 87 years. Control gastric analysis by the usual intubation technic was performed in 50 of these. Histamine was used as the parietal-cell stimulant in 24 cases, and caffeine and alcohol in 1 case each. Contraindications such as angina pectoris, active gastrointestinal bleeding, severe ulcer pain and allergy precluded their use in the remainder.

This study confirms the findings of Segal that the tubeless method of gastric analysis is a valid test for the presence of free hydrochloric acid in the stomach. In the 58 examinations reported herewith free acid was demonstrable in the clinical conditions in which it could be expected, such as active duodenal and benign gastric ulcers, and not demonstrable in known achlorhydric entities such as pernicious anemia, gastric cancer, and atrophic gastritis. Only 2 examinations by the tubeless method failed to show free acid when it was detected by the conventional technic. It should be clearly understood that the indicator resin tests the ability of the stomach to secrete free hydrochloric acid and does not measure pH or units of acid. Although it is a grossly quantitative test, its interpretation as such is unreliable and is not recommended. (New England J. Med., Dec. 4, 1952, M. Malach and B. M. Banks)



### Portal Hypertension

Recent advances in the surgical and medical treatments for portal hypertension have provided a new lease on life for many of the patients with this condition. Today such fatal complications as massive hematemesis associated with esophageal varices, melena, and ascites can be controlled by direct surgical attack. Whipple, Blakemore, and Lord have demonstrated the feasibility of shunting the portal flow directly into the systemic venous circulation by either a portacaval or a splenorenal anastomosis, thus reducing the blood flow through the collateral venous channels in the esophagus and at the same time lowering the portal venous pressure.

Portal hypertension may be caused by an intrahepatic or an extrahepatic block. The intrahepatic portal bed block is the most common, and is usually the result of hepatic cirrhosis. The flow of blood to the liver is obstructed secondary to the scar tissue replacement of the liver parenchyma. Because it is probably not completely occluded, all the portal flow is not forced through the collateral channels; however, a very large portion of it may be shunted. In this type of block a considerable volume of the hepatic artery blood flow is blocked from entering the hepatic veins and is shunted back into the portal vein, thus increasing the blood flow through the collateral channels.

The extrahepatic portal bed block is caused by an occlusion of the portal vein or its main tributaries by fibrous or scar tissue, which may be congenital or acquired. The former probably occurs from the extension into the portal system of the obliterative process that occurs after birth in the umbilical vein and the ductus venosus, thus causing the esophageal varices and splenomegaly as seen in young children. The acquired form occurs as a result of venous thrombosis of the portal vein, phlebitis, fibrous stenosis, or cavernomatous transformation of the portal vein.

Three main sites of communication between the portal and the caval circulations are found in cases of portal hypertension. They are: 1. At the point of transition between absorbing and protective epithelium, such as is found between the coronary vein of the stomach and the azygos and the diaphragmatic veins, and also between the superior, middle, and the inferior hemorrhoidal veins. This communication is of the greatest importance, because it is the one concerned with esophageal varices. 2. At the site of embryologic circulation, namely, the falciform ligament which contains the paraumbilical veins. 3. Within the abdomen where the gastrointestinal tract with its appendages and glands becomes retroperitoneal developmentally or adherent to the abdominal wall pathologically.

Any massive bleeding from the gastrointestinal tract is cause for suspicion of esophageal varices. Melena rarely may be the first symptom, because bleeding may occur elsewhere in the gastrointestinal tract, especially in the stomach, where large dilated veins are frequently encountered. Portal hypertension, therefore, should always be considered in the differential diagnosis of hematemesis or melena. Physical examination usually reveals

an enlarged spleen, the so-called "congestive splenomegaly" suggested by Larrabee. Hemorrhoids also develop owing to the anastomosis between the superior hemorrhoidal plexus and the middle and inferior hemorrhoidal veins. The so-called spider angiomas of the abdominal wall are also signs of portal hypertension. Ascites is a common observation in patients with moderately advanced and late cirrhosis. Jaundice is usually not deep, being present at some time in the majority of cases; however, it may disappear and recur intermittently. The patient of cirrhotic habitus (the man with little or no hair on his chest) should always be kept in mind, because these persons are predisposed to cirrhosis of the liver. Blood examination usually reveals secondary anemia, leukopenia, and thrombocytopenia. Sternal puncture may be necessary in the differential diagnosis of blood dyscrasias. If the block is intrahepatic, liver function tests give positive results, whereas normal results of such tests indicate extrahepatic pathologic change. Roentgenologic examination is a most important diagnostic procedure and is of great value. The so-called "pearl necklace" or "beaded" pattern is pathognomonic. Esophagoscopy is helpful but dangerous.

To date many surgical procedures have been used with varying degrees of success. Ligation of the coronary vein has been tried, but has not met with great success. The Talma-Morison procedure is a form of omentopexy; this merely copies the natural diversion of blood back to the caval circulation. Splenectomy has been advocated, because it removes 40% of the portal blood. Splenic artery ligation has been performed in the extremely ill patient.

There is still some question as to which shunt operation is the best. Whipple, Blakemore, and Lord, as well as Blalock, seem to prefer the portacaval shunt, because this produces the most nearly complete shunt of the portal blood and at the same time a maximum reduction of the portal hypertension. However, Linton and his associates prefer splenectomy, with an end-to-side splenorenal shunt preserving the kidney, their rationale being that this type of operation serves two purposes: first, it removes the spleen and thereby reduces the portal blood flow by as much as 40%, and second, it permits an anastomosis between the splenic vein and renal vein without sacrifice of the kidney. (J. Internat. Coll. Surgeons, Nov. 1952, P. Thorek)

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#### Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U. S. Navy Medical School, National Naval Medical Center, Bethesda 14, Maryland, giving full name, rank, corps and old and new addresses.

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### Convulsive Disorders

To aid the Bureau of Medicine and Surgery in the formulation of a plan for the study of members of the Naval Service with convulsive disorders, the National Research Council has prepared an outline of indications and contra-indications for certain diagnostic procedures, and Dr. Francis M. Forster, President of the American League Against Epilepsy has submitted a discussion of the same problem. In addition to the obvious benefit to patients in the treatment of convulsive disorders, accurate determination of etiology and prognosis is of considerable importance in deciding the issues of service incurrence and aggravation and in the effective and equitable administration of other provisions of the Career Compensation Act of 1949. Convulsions having onset beyond the age of 20 years, the age group with which the Navy is primarily concerned, will by reason of the increasing relative incidence of organic focal causes be subjected to closer scrutiny than the younger age group where it is recognized that the so-called idiopathic varieties are more commonly seen. The same considerations, as developed in the history and physical examination, will, of course, influence the final plan of study in all cases.

Some of the elements of a complete examination and the indications and contra-indications surrounding them are summarized in the following outline.

1. Complete history and physical examination including a complete neurological examination.
2. Laboratory studies to include serum calcium, glucose tolerance test, and a serologic test for syphilis.
3. X-ray skull series.
4. Complete spinal fluid examination in all cases except where the standard contra-indications to lumbar puncture are present.
5. Electroencephalogram. Correlated with the medical history, EEG findings have been shown to be reliable, constituting possibly the most valuable screening tool available at the present time. If the EEG is of the generalized dysrhythmic type and neither history nor neurological examination suggests a focal lesion, the diagnosis may be considered with reasonable certainty to be idiopathic epilepsy and further study may be omitted.

Contra-indications are limited to the uncooperative patient or the person in whom medications presently being taken may be expected to alter the tracing.

6. Pneumoencephalogram. Air studies are indicated in all physically acceptable patients with onset of seizures beyond the age of 30 years and in all others in whom clinical or laboratory features may suggest the possibility of a focal lesion. Clinical features indicating possible focal disease are history of brain disease or head injury, focal convulsions, apparently generalized seizures with a focal aura, or post-ictal deficit after a single seizure. In every acceptable patient presenting localizing neurological findings air studies should be carried out. Laboratory findings include focal EEG changes, normal EEG with or without additional evidence of a focus, x-ray evidence of localized

brain disease, and elevation of spinal fluid pressure or total protein content. Contra-indications to pneumoencephalogram are choked disk or other evidence of increased intracranial pressure, active inflammatory disease of the brain or meninges, posterior fossa tumor (rarely complicated by convulsions), and general debility.

Depending on the lesion suggested and its probable location as determined from preliminary studies, the selection of the type of pneumoencephalography to be employed will be made by the examiner. In most cases, however, the lumbar approach is to be preferred inasmuch as it offers more satisfactory visualization of the subarachnoid space and may be performed without the necessity of a surgical procedure.

7. Cerebral angiogram. Indications for cerebral radioangiography are essentially the same as for pneumoencephalography although the contra-indications are somewhat less rigid, and it presents, therefore, a satisfactory alternative or supporting procedure. Angiogram is particularly important in the identification of brain tumors, angiomas, and vascular anomalies but may give positive evidence of other brain disease.

Contra-indications are sensitivity to the dye, moderate to advanced arteriosclerosis, and general debility.

It should be remembered, however, that neither a normal pneumoencephalogram nor a normal angiogram excludes the presence of a small scar or tumor or other fixed lesion, any one of which may be the focus of convulsive seizures yet be so small as not to be demonstrable by any of the above-mentioned diagnostic methods. Continued observation over a period of months or years may be needed before a definite diagnosis is established.

Facilities and trained personnel are available for electroencephalography at all the larger naval hospitals. For pneumoencephalography and cerebral angiography, patients should be transferred to one of the following neurological centers: U. S. Naval Hospital, Bethesda, Md., U. S. Naval Hospital, Chelsea, Mass., U. S. Naval Hospital, St. Albans, N. Y., or U. S. Naval Hospital, Oakland, Calif. (P. Q. & M. R. Div., BuMed)

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#### Friedreich's Ataxia and Its Cardiac Manifestations

Friedreich's ataxia is a chronic, progressive, hereditary degenerative disease which has its onset in early life. Its association with cardiac disease and manifestations were first noted by Friedreich, who originally described the syndrome. The accumulative clinicopathologic reports in the French, English, and recently, the American literature are adding to the information by which its etiology and therapy may be discovered.

The pathologic changes of this disease are neurologic degenerative processes involving the posterior and lateral columns of the spinal cord, the fasciculus gracilis and cuneatus, the spinocerebellar tracts, and Clarke's



columns. Lesions of the dorsal root and posterior columns are most severe in the lumbosacral region with an ascending degeneration. Occasionally the medulla oblongata and cerebellum are involved. In a few reported cases there was atrophy of the anterior horn cells with degenerative changes in the peripheral nerves and the posterior roots. Marked proliferation of glia fibers are seen in the degenerated fiber tracts.

The neurologic symptoms are: (1) Ataxia—patient walks on a "broad base," gait is "drunken"; (2) ataxic speech—slow, unclear, dysarthritic, scanning, syllabilization, explosive; (3) mentality usually intact, though it may be somewhat retarded; (4) scoliosis; (5) pes equinovarus with arching of foot, cavus, and hyperextension of the large toe; (6) deep tendon reflexes, diminished to absent; (7) Babinski's sign usually positive; (8) Romberg's sign usually positive; (9) nystagmus may be present, and (10) impairment of position and vibratory sense.

The signs and symptomatology of the cases vary with the heart size, that is, whether the heart is normal in size as seen in many cases, or whether it is hypertrophied and dilated. The symptoms are: (1) congestive failure, (2) palpitations, (3) substernal and retrosternal oppression and pain, (4) anginal syndrome, and (5) acute myocardial infarction (1 case). The signs are: (1) systolic precordial murmur, (2) early and mid-diastolic apical murmur with accentuated P<sub>2</sub> (confirmed by phonocardiogram), (3) presystolic apical murmur heard best after exercise (confirmed by phonocardiogram), (4) diastolic apical murmur associated with auricular fibrillation present in several cases (necropsy revealing an absence of valvular lesions and microscopic evidence of rheumatic involvement of the myocardium), (5) paroxysmal bouts of auricular tachycardia, (6) auricular fibrillation, (7) regular sinus rhythm with numerous auricular premature contractions or ventricular premature contractions, and (8) parasystolic ventricular rhythm (1 case).

In this series there were 8 men and 3 women patients, all Caucasian. Their ages at the time of study varied from 27 to 66 years in the women, and 36 to 45 years in the men. The series included a brother and 2 sisters. Familial involvement was present in 6 of the 9 cases. The average age at onset was 14 years, youngest at 5 years, and the oldest at 24 years. The essential neurologic symptoms for the diagnosis of Friedreich's ataxia were present in all cases, with occasional negative findings of nystagmus, scanning speech, and signs of mental retardation or disturbance. Two cases had congestive failure; 1 had paroxysmal auricular tachycardia, and another had paroxysmal auricular fibrillation. Eight of the eleven cases lacked cardiac symptoms. The heart was enlarged in only 3 cases. Murmurs were not present in 8 of the 11 patients. The presence of a presystolic apical murmur followed by early systolic and protodiastolic murmurs, in addition to bouts of paroxysmal auricular tachycardia, led the authors to suspect rheumatic carditis with mitral stenosis and insufficiency in 1 case. Premature contractions appeared in only 2 patients, one being premature auricular contractions and the other, premature ventricular contractions. All the patients had nega-

tive Wassermann reactions. There were 2 deaths in this series, one of bronchopneumonia and the other of congestive heart failure.

The course is progressive in character. The disease may last from 30 to 40 years. The patient may become bedridden at any time during the progression of the disease. The lower extremities are usually involved prior to the upper extremities. The patient may die of congestive failure or an intercurrent infection, such as pneumonia. To date the therapy is symptomatic. (Am. Heart J., Dec. 1952, A. J. Schilero, E. Antzis, and J. Dunn)

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#### Effective Vaccine Therapy in Chronic Bacterial Infections of Upper Respiratory Tract

The important role played by chronic upper respiratory infection in the etiology of many systemic diseases and functional disorders is not sufficiently recognized. Relief or cure of the latter may be impossible until the primary focus of infection is removed. Unfortunately, attention is concentrated on the infected tissue rather than on the infecting organisms. Rhinolaryngologists eradicate infected tissue and drain infected cavities and then believe that they have removed the focus of infection. As a rule, they make no attempt to destroy the infecting bacteria that remain at and near the infective site or to neutralize their toxic products. This requires stimulation of specific antibody production to combat the infecting bacteria and their toxins.

In cases of acute infection removal of the focus may sometimes be accomplished by the administration of the appropriate antibiotic. However, this is less applicable in cases of chronic infection, because in such cases it does not destroy all the organisms, its beneficial action does not persist long after its suspension, and it cannot be given indefinitely or for long periods without danger. To rid the body of a chronic infection, the most effective procedure is to inject a properly prepared vaccine consisting of the bodies of the killed infecting bacteria, which contain their endotoxins, together with the broth in which they grew, which contains their soluble exotoxins. It is essential, however, that these bacillary bodies and exotoxins be of the particular strain that is causing the infection, so that they will stimulate the manufacture of the specific antibodies required to combat them and their specific toxins.

The author's results with the pathogen-selective vaccine were generally favorable. In many cases the patient was completely cured of both the local and the systemic infection. In others the local infection and the accompanying toxemia were kept under control by vaccine therapy, without being completely cured. In some of these cases it was necessary to continue the vaccine treatment for years or indefinitely in order to insure comfort. Occasionally a patient was so hypersensitive to the bacterial toxins, or became so during the treatment, that even the most infinitesimal dose produced an unfavorable



reaction. When this occurs, it may be necessary to discontinue vaccine treatment. In many cases of bacterial allergy, characterized by constant sneezing, asthma, et cetera, cure was obtained by bacterial vaccines. Even patients allergic to pollens, dog hair, and lobster, combined with chronic sinusitis, were completely relieved with the administration of a bacterial vaccine, as though the external allergens were sufficiently irritating to produce hypersensitivity only when the mucous membranes were inflamed by infection. Patients with systemic disease, such as chronic osteoarthritis and arthritis of no particular type, and with functional disorders of the circulatory and nervous systems, the digestive and genitourinary tracts, and the eye were cured by removal of the bacterial focus of infection. This was aided in many instances by enucleation of infected tonsils or tonsillar remnants, x-ray treatment of the nasal accessory sinuses, and extraction of infected teeth and tooth roots. (Arch. Otolaryng., Nov. 1952, M. Solis-Cohen)

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### Etiology of Carcinoma of Lung

In an investigation designed to throw light on the etiology of carcinoma of the lung nearly 5,000 hospital patients have been interviewed. The interviews took place in the years 1948 to 1952 in hospitals in London, Bristol, Cambridge, Leeds, Newcastle-upon-Tyne, and in the rural areas of Dorset and Wiltshire. The questions asked covered a very wide range, including the occupational histories of the patients, where they had lived and the forms of domestic heating in their homes, their previous attacks of respiratory illnesses, their habits with regard to smoking, and, for other purposes, some particulars of their dietary habits and use of purgatives.

Preliminary figures on tobacco-smoking were published in a previous article. This present article gives corresponding data for the whole of the material collected as well as the analysis of other questions included in the inquiry. The main comparisons were between 1,465 patients with carcinoma of the lung and an equal number of "matched control" patients with other diseases, each of these were carefully chosen so as to be of the same age, the same sex, and, so far as possible, in the same hospital at the same time as a lung-carcinoma patient.

There was no appreciable difference between the 2 groups in the number of persons belonging to the Registrar-General's five social classes, and no association was found between any type of occupation and lung carcinoma which would suggest the presence of an etiological agent likely to be of general significance.

With regard to the possible effects of fumes in the atmosphere, both within and without the home, there is no significant difference between the groups. Of the lung-carcinoma patients 23.0%, and of the control patients 21.5%, had lived near a gasworks for a year, or more. Their use of coal,

gas, or electric fires or other forms of heating in their homes did not differ appreciably. Fewer of the lung-carcinoma patients lived, or had lived, in the countryside and more, in the towns.

The lung-carcinoma group in comparison with patients with other forms of cancer more often gave a history of a previous attack of pneumonia and of chronic bronchitis. Detailed analysis of the data suggests, however, that this difference may be due merely to the lung-carcinoma patients, with their respiratory symptoms, recalling more readily than other persons their previous attacks of respiratory illness. The data were not accurate enough for an etiological relationship to be postulated.

Of the 1,357 men with carcinoma of the lung 7, or 0.5% were nonsmokers (as defined in the text); of the 108 women there were 40, or 37.0%. The corresponding figures for their paired controls were 61 men (4.5%) and 59 women (54.6%). Of the men with lung carcinoma 25.0% reported that they had been smoking, before the onset of their illness, an average of 25 or more cigarettes a day (or the equivalent in pipe tobacco). The corresponding figure for the males control patients was only 13.4%. For women these proportions were 11.1% for the carcinoma group and 0.9% for the controls.

For men these differences were present consistently in each of the 5 areas of inquiry. For women they were present in London but not in the 28 patients observed in the provincial towns, where only 1 woman with the heavier smoking habits was found.

Estimated death rates for Greater London indicate that the mortality from carcinoma of the lung may increase in approximately simple proportion with the amount smoked. Among men from 45 to 64 years of age the death rate in nonsmokers was negligible, while in the heavier-smoking categories it was estimated to reach 3 to 5 deaths per annum per 1,000 living.

Regular users of petrol lighters were found with equal frequency in patients with lung carcinoma and in the control patients with other diseases (42.9% and 41.3%); the proportions who said they inhaled were similar (64.6% and 66.6%); and so were the proportions of cigarette-smokers who had smoked mainly hand-rolled cigarettes (20.7% and 19.1%). On the other hand, fewer of the cigarette-smoking patients with lung carcinomas had ever used a cigarette holder regularly (5% against 12% of the controls), and only 3 out of 504 had smoked filter-tipped cigarettes, compared with 15 out of 467 controls. The observations in these respects are too few for a definite conclusion, but conceivably they may have a bearing on the appreciably lower risks reported here for pipe smokers compared with cigarette-smokers. Each of these methods of smoking might partly separate out an active agent before it reached the respiratory tract.

The validity of these various results was studied, and it was concluded that the association between smoking and carcinoma of the lung is real. It is not argued that tobacco smoke contributes to the development of all cases of the disease—a most unlikely event. It is not argued that it is the sole cause of the increased death rate of recent years nor that it can wholly explain the different mortality rates between town and country. (Brit. M. J., Dec. 13, 1952, R. Doll and A. B. Hill)



### Meningococcic Meningitis

Results of treatment of meningococcic meningitis with sulfonamides have been so successful that therapy with these agents is considered to be the method of choice by most investigators.

The establishment of an additional reliable therapeutic regimen for a condition as serious as meningococcic meningitis seemed desirable because the alternative regimen could be used for patients who were hypersensitive to sulfonamides and for those in whom the differential diagnosis between pneumococcic meningitis and meningococcic meningitis was uncertain.

For this reason the authors treated alternate patients with meningococcic meningitis either with sulfonamides or with large parenteral doses of penicillin, and the results of their study are reported.

It seems apparent that within the limitations of the study, penicillin in doses of 1,000,000 units every 2 hours intramuscularly was at least as effective, and possibly more so, in the treatment of meningococcic infections than Gantrisin in conventional doses.

A possible limitation of the study is that it was done during an endemic period when the only fatalities were in acute fulminating cases and there were practically no deaths from meningitis per se. This was due in part to the fact that most of the patients were in the favorable age groups, namely, between 1 and 40 years of age. Working with a group where the prognosis is so good, there is less likelihood of demonstrating small differences in therapeutic efficiency. Within this limitation, however, the results obtained seemed to indicate that penicillin in the doses used is excellent therapy. It is apparent that aureomycin adds nothing and perhaps detracts when added to penicillin. Smaller doses of penicillin used with Gantrisin seem to be slightly more effective than the latter alone, but may not be as effective as large doses of penicillin.

The choice of Gantrisin as the sulfonamide used in this study is open to some question, because it has not received the large-scale testing to which sulfadiazine has been subjected. During the past 6 years it has been the authors' experience that Gantrisin has accomplished everything which one would expect from sulfadiazine. In addition, during this time, they had no renal complications among well over 100 meningitic patients, an experience which is in considerable contrast to the relatively high incidence of renal involvement from sulfadiazine in the meningitic patient. Because Gantrisin was so superior in this latter respect and seemed of equal therapeutic benefit, it was chosen for this comparative study.

An unanswered question is whether the action of penicillin in these large doses would be improved upon or made worse by the use of sulfonamides in addition. From the poor results obtained when this combination was used in the patients with fulminating infections, it is apparent that combination therapy is ineffective in this group, which constitutes the major therapeutic problem.

It is concluded that penicillin in large doses is a satisfactory therapeutic agent for the average patient with meningococcic meningitis and can be used in lieu of sulfonamides when desired. (J. Lab. and Clin. Med., Dec. 1952, M. H. Lepper, H. F. Dowling, P. F. Wehrle, N. H. Blatt, H. W. Spies, and M. Brown)

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### Congenital Malformations of the Heart

The advent of cardiac surgery brings new responsibilities to the clinician, not only because of the necessity for accurate diagnosis of the nature of the malformation, but also in the selection of patients for surgery and in the prevention of needless operations.

If the patient is but slightly incapacitated or entirely asymptomatic, the risk must be minimal and the degree of benefit great in order to justify operation. On the other hand, if the patient is severely incapacitated and the prognosis without operation is bad, considerably greater operative risk, for even moderate benefit, is justified.

Careful evaluation and sound advice to the patient are especially important, because in the last 10 years there has been a complete change in the philosophy of patients and parents. Formerly there was grave hesitation concerning operations and there was widespread fear of "experimenting" on a patient. Today patients frequently demand operation. Therefore, the physician has a great responsibility in the proper evaluation of his patient. To do so wisely, the physician must not only be able to diagnose the nature of the malformation, but also know the risks, the dangers, and the amount of benefit to be derived from operation and to balance these against the prognosis without operation. This is not always easy because the prognosis varies with the nature of the malformation and with the severity of the abnormality. For this reason it is a grave mistake to tell a patient or a parent that the child must have an operation or he will die. If operation is not indicated, it is difficult for the consultant to persuade the parents of the fact. If operation is not possible, irrevocable harm may have been done.

The prognosis, without operation, is usually better than the physician anticipates. Although some infants die from cardiac failure and some die from anoxemia, many infants survive innumerable attacks of paroxysmal dyspnea. Most infants survive respiratory infections and pneumonia. Children with malformed hearts usually survive the common contagious diseases of childhood as well as do other children.

Operation is only justified in infancy if life is precarious without operation. In general, as long as the infant is growing and gaining normally there is little or no cause for concern. Failure to gain is often the first manifestation of difficulty. Cyanosis due to a malformation of the heart is usually indicative of a serious, but not necessarily of a fatal, malformation.



Broadly speaking, the main causes of death in patients with congenital malformations of the heart are cardiac failure, anoxemia, and occasionally cerebral thrombosis secondary to severe polycythemia. Formerly subacute bacterial endocarditis took a heavy toll. This disease can frequently be prevented by the administration of antibiotics or penicillin prior to and immediately following dental extraction or tonsillectomy; furthermore, if the disease does occur, it is now curable. Pulmonary hypertension and abnormalities of the lungs may cause severe or even fatal cardiac strain.

The proper handling of the infant or child is important. If the mother is given a hopeless prognosis, she naturally and inevitably spoils the child and even though he may be rehabilitated at a later age, the psychologic damage done is well nigh impossible to overcome. The well-adjusted, wisely handled, severely handicapped child blossoms after operation, whereas the spoiled child will seek other ways of demanding attention. Therefore, the more normal the child's life can be, the better it is for the child and the parent.

Whenever possible the child should attend a regular school. He should be encouraged to play and develop his physical strength. It is only in cases of severe pulmonary stenosis or aortic stenosis that exercise may place a strain on the heart. In a patient with pulmonary stenosis, evidence of progressive cardiac enlargement is an indication for operation. In patients with aortic stenosis, because operation is not yet possible, restriction of activity may be necessary. With other malformations the patient usually limits his own activity; it is seldom necessary for the doctor or parent to do so.

Furthermore, it should be remembered that "we know not what is to come." Even though a malformation is not operable today, it may be amenable to surgery within the lifetime of that individual. For this reason the existence of a cardiac malformation is seldom, if ever, justification for sterilization. (J. Pediat., Dec. 1952, H. B. Taussig)

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#### Monarticular and Destructive Arthropathy in Reiter's Syndrome

The occurrence of a polyarthritides, usually of the asymmetric variety, and accompanied by urethritis and conjunctivitis, is now rather generally accepted under the name of Reiter's disease or Reiter's syndrome. During the past 5 years, 7 cases of this symptom-complex were observed at the Bronx Veterans Hospital, 2 of which presented features not usually described in this disease.

The diagnosis of Reiter's syndrome rests on clinical grounds and invariably depends on the exclusion of a gonorrheal infection by bacteriologic study. The disease is usually limited to young adult males. The initial symptom in most cases is urethritis. This varies from a slight muco-purulent discharge

noted only on arising in the morning to a more or less continuous thick purulent discharge accompanied by frequency and dysuria and, on occasion, hematuria. There is an associated prostatitis or cystitis. Epididymitis is conspicuous by its absence. The duration of the urinary symptoms is variable, from a few days to months.

The conjunctivitis which is usually purulent may, however, in a significant number of cases, be entirely absent. When present the inflammation is diffuse and may spread to the sclera or cornea. Although the exudate is purulent, cultures are most often negative. This portion of the triad is frequently of short duration, but recurrence with the other symptoms is not uncommon.

Perhaps the outstanding symptom and certainly the one for which the patient is most apt to seek hospitalization is the arthritis. This is characterized by sudden onset, its appearance having been heralded by the urethritis and the conjunctivitis. Almost any joint in the body may be involved, but there is a definite predilection for the weight-bearing joints (ankles and knees). The small joints of the hands and feet, hips, and vertebral joints are rarely affected. Moderate fever is usually seen with the arthritis as well as a slight to moderate degree of leukocytosis and elevated sedimentation rate. The involved joint has the appearance of an infectious arthritis. It is reddened, warm, swollen, and tender. The joint involvement is usually progressive and multiple and clears without residua, but as in the cases reported it may be solely or predominantly monarticular and may progress to a destructive arthropathy.

This condition is not infrequently complicated by skin and mucous membrane lesions. Perhaps the most common of these is "balanitis circinata." Of particular interest is the occasional occurrence of a keratotic dermatitis which is indistinguishable from "keratoderma blennorrhagica" which, for many years, had been said to appear only as a complication of gonococcal arthritis. Two such cases were seen in the authors' group of patients.

Two of the 7 patients seen in this hospital during the last 5 years were of interest because in one there was only monarticular disease and the other had predominantly monarticular arthritis which progressed to complete joint destruction. Because of insufficient mention in the literature of these possibilities, the 2 cases are presented. More detailed description is given of the second case because of its unusual interest.

The etiology of the symptom-complex called Reiter's syndrome still remains unknown. Whether the disease is related in some way to bacillary dysentery or to the pleuropneumonia-like organism remains a matter for further investigation. Perhaps any of several types of infectious processes can produce as an aftermath the triad of urethritis, conjunctivitis, and arthritis; or the disease may actually be a variant of rheumatoid arthritis. Actually, the histologic picture of the few biopsied synoviae is not unlike that of the proliferative changes seen in rheumatoid arthritis. Nevertheless, it is believed that, at this time, it warrants its place as a definite clinical entity and a more thorough knowledge of its more protean manifestations and sequelae should be attained. (Am. J. M. Sc., Dec. 1952, J. K. Guck and J. Wolf)



### Hyaluronidase in Ophthalmology

This article evaluates the use of hyaluronidase in the nonsurgical treatment of pterygiums and reports other uses of the drug in ophthalmology.

Pterygiums of the eye are a common disease in Panama. It is extremely prevalent in this tropical area because of improper nutrition in the poorer classes of people and such local irritating factors to the eyes as the tropical sun, dusty dry season, and occupations near the water fronts. Because pterygium is a constant problem in the tropics, it was believed that any new nonsurgical treatment would be valuable in the management of this disease.

In the author's experience the use of hyaluronidase is of value in the treatment of early pterygiums of the eye. It caused complete disappearance of the pterygium and the appearance of the conjunctiva returned to normal if the pterygium was fleshy, vascular, and if the apex of the pterygium had not encroached on the cornea more than 1 mm. If the pterygium was old, fibrous, and avascular, the hyaluronidase did not cause regression of the pterygium and surgical intervention was necessary.

During the study, several different types of ocular disease were treated with hyaluronidase in order to establish other uses of the drug. Four cases of traumatic subconjunctival hemorrhage were treated with subconjunctival injection of a hyaluronidase-novocain solution. These hemorrhages were early and extensive. In 4 days, after 2 injections of hyaluronidase (50 turbidity-reducing units) the hemorrhage had completely reabsorbed. It was thought that the reabsorption period of the hemorrhage was definitely reduced by hyaluronidase.

Two cases of early, mild episcleritis were treated with subconjunctival injection of hyaluronidase (50 units) each. After 2 injections over a 5-day period there was no clinical evidence of the episcleritis. In 1 case of severe nodular episcleritis the drug had no effect.

A 50-year-old man, with a progressive, marginal degenerative process of the cornea of 15 years' duration with marked bilateral limbal degeneration and ciliary injection, was given 8 injections of hyaluronidase (50 units) in each eye over a 2-month period. After each treatment it was noted that the calcified area was less and that the ciliary injection had regressed. Upon completion of the treatment, the degenerative area was markedly reduced in one eye and completely eliminated in the other. The patient has been asymptomatic over a 6-month period since cessation of the treatment. This patient was allergic to sulfonamides, penicillin, atropine, and scopolamine, and yet did not manifest any allergic signs or symptoms while treated with hyaluronidase.

Fifteen patients of the Palo Seco Leper Colony, Panama Canal Zone, with long-standing iritis were treated with hyaluronidase. These cases of old leprous iritis presented dense posterior synechias, no flare, nor any signs of activity. All the patients were treated by local instillation of atropine (1%). Half the patients were given 4 injections at the limbal margin of

hyaluronidase (50 units) with 0.2 cc. of adrenalin over a 2-month period. In the other patients adrenalin was not used with the hyaluronidase. The attempt to release the posterior synechias was futile. The patients did not exhibit any side reactions from the use of the hyaluronidase.

Atkinson reported that the use of hyaluronidase, procaine, and epinephrine in retrobulbar injections for surgical anesthesia caused the surgical procedure to be more difficult. It was thought that, because of the hypotony associated with this type of anesthesia, it might be of definite value in the surgical removal of a dislocated lens in the presence of secondary glaucoma. In the 1 case of dislocated lens with increased intraocular pressure in which hyaluronidase was used with procaine-epinephrine retrobulbar anesthesia, the tension was markedly reduced after the retrobulbar injection and it was thought that the decreased tension definitely aided in the removal of the lens without the loss of vitreous.

The use of hyaluronidase in the vitreous or the anterior chamber is not advisable because of severe inflammatory reaction.

In the treatment of keratitis and iritis with subconjunctival injections of cortisone, it was found that if 0.6 cc. of cortisone was mixed with hyaluronidase (100 units) and injected subconjunctivally the cortisone was spread over a greater subconjunctival area, was more homogenized in nature, and that the absorption time from the subconjunctival area was lessened. How beneficial this is to the actual disease process is still to be determined.

Hyaluronidase appears to be of value when a spreading factor is desired either as a primary action or in the dispersion of drugs. A reaction of this spreading factor appears to be increased circulation to the area involved. (Am. J. Ophth., Dec. 1952, F. R. Carriker)

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### Radium Therapy of Cancer of the Cervix Uteri

Until about 15 years ago, complete empiricism had prevailed in the treatment of cancer of the cervix uteri with radium. The uterine tandem was originally used alone; later colpostats of various shapes were introduced. The dosages were calculated in terms of milligram hours, and clinical experience alone determined the amount of radium tolerable to the tissues. The T-shaped arrangement of the radium sources is, of course, geometrically logical.

Regardless of the technique used, the results are similar in institutions all over the world where careful radiotherapy is practiced. This shows that the usual T-shaped arrangement of the radium sources permits a satisfactory volume of tissue to be irradiated adequately in a certain percentage of cases. Most of the work so far has been done with calculations based on theoretical geometrical arrangement of radium sources and their relationship with pelvic organs. Applicators were designed accordingly. Careful three-dimensional procedures were devised, the rectum and bladder being visualized by opaque media.



Recently, direct dosimeters have been designed to read dosage rates in the bladder and rectum at the time of implantation, and on the pelvic wall while the radium is in situ at the time of a lymphadenectomy.

The multiplicity of radium techniques and of applicators shows that the best arrangement of radium sources, the respective loading of the uterine tandem and colpostat, and the best design of the colpostat are still unknown. It also demonstrates the lack of knowledge concerning the respective contributions of the uterine tandem and colpostat to the various points where disease is likely to be present, as well as to the rectum and bladder. The number of milligram hours varies from a total of 5,000 (which is the dosage delivered by a number of techniques still in use) to a total of 12,000 or 13,000 as used in the Manchester system. The average is 7,000 to 8,000 mg. hr. (Paris and Stockholm techniques). The tolerance of the rectum and bladder has been set around 5,000 to 6,000 gamma r (no time factor correction) although no measurements have been made. There are no series reported where rectum and bladder damage has been correlated with figures. Theoretical calculations, assuming average positions and distances, are entirely inaccurate. Within a few centimeters of radium sources, the gradient of dosage rate is so sharp that small changes in distance bring considerable difference in dosage rates.

This is still an empirical era in the use of radium therapy in cancer of the cervix. A coordinated effort should be made to determine by measured data the tolerance of the vault, rectum, and bladder; the amount of irradiation tolerable to the tissues which will control the greatest number of primary lesions; and the range of doses which would eventually control disease in the pelvic lymph nodes. The designing (and loading) of uterine tandems and colpostats should depend on the knowledge of the contribution of the various radium sources to all important points of the pelvis. The applicator should be flexible enough to be adaptable to the great differences due to individual anatomy, as well as pathologic changes. The insertions ought to be multiple so that corrections can be made, if necessary, at the second or third insertion. This helps eliminate the zones of underdosage where disease is clinically present or likely to be. The dosimetry should not only be a check but a guide in the treatment. It requires calculations by means of simple dose finders and direct measurements at the time of implantation.

In the authors' study up to the present time 40 cases have had direct measurements and 30 cases both measurements and calculations. Several months were necessary to put both methods on a reliable routine basis. The measurements were found to be of definite help in the guidance of the treatment, particularly in detecting high doses to rectum and bladder, and in determining which radium sources were responsible. The loading and size of the applicators were changed accordingly in subsequent treatments. When doses are within the accepted tolerance limits a feeling of safety is engendered.

Many more cases will have to be studied and followed up before conclusions can be drawn on tolerance levels and value of the technique. However,

some points are already evident: (1) All data obtained, even with direct measurements or careful three-dimensional reconstruction, are only approximate because of the steep gradient of intensity in the vicinity of radium sources (less than 5 cm. ). A slight difference in pressure on base of bladder or anterior rectal wall brings appreciable difference. In addition, even with tight packing, there is probably some displacement of the applicators during the application. The three-dimensional reconstructions show considerable difference in doses depending on the choice of bladder and rectal points and also difference with measured values. (2) Tables based on calculations of dosages for theoretical geometrical arrangements of radium sources to arbitrary points A and B, and to rectum, bladder, and pelvic nodes, are meaningless and even misleading. Varying anatomy and distortion because of disease produce differences in distance which preclude the establishment of tables of dosages for the complete radium system. The same radium system in the 2 insertions can give great difference in dosages. (3) For one-piece applicators the doses at points A and B are accurate but for separate tandem and colpostats a three-dimensional technique is necessary, because of the varying degree of flexion and, at times, lateral displacement of the uterus. The dose at point A is just the dose at some point in the paracervical triangle. The dose at point B is an index of the lateral throw-off but is only exceptionally representative of obturator node group. (4) With the authors' applicators the tandem contributes most to the bladder dose. In case of marked anteflexion it can be very high. This confirms the findings of Lederman and Kottmeier, showing that this is true regardless of the type of colpostats. The contribution of the authors' colpostats to the rectum has, by and large, been low so that packing between colpostats and rectovaginal septum has not often been necessary. In retroverted uteri or in senile, atrophic uteri, because of the proximity of the tandem to the rectum, doses have been excessive. The authors' findings here differ from those of other authors mentioned who found that their colpostat contributed mostly to the rectal dose. This is easy to understand in view of the design of their colpostats. The difference in findings shows that conclusions for one technique cannot be applied to another. (5) With the authors' technique, the posterior fornix could possibly be underdosed, so that measurements are taken at that site. (6) It has already been found that packing displaces the radium sources upward and centrally so that the bladder and rectal doses will vary with the packing. The authors also found, in several instances, that the doses to rectum and bladder were less with the whole radium system than with the tandem alone. However, their applicators with handles are responsible for most of the displacement. (7) The tolerance of the bladder and rectum is a function of the size of the area of high dosage. Readings taken every centimeter at the time of insertion of the probe give an idea of the actual dimensions of the area of high dosage. (8) For ovoids alone, the maximum rectal point is from 5 to 6 cm. from the anus and for the complete system from 7 to 9 cm. (9) The complications can be correlated with the measured figures and so



tolerance doses can be established on an experimental basis. (10) While lymphadenectomies are performed, direct measurements, being more reliable, ought to be taken with the radium still in situ at the end of application time. (Am. J. Roentgenol., Dec. 1952, G. H. Fletcher, R. J. Shalek, J. A. Wall, and F. G. Bloedorn)

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### Plastic Sponge Prosthesis Following Resection in Pulmonary Tuberculosis

There are certain requirements which have to be met before any foreign body can be placed in the tissues or utilized as a prosthesis. The material should be nonirritating, chemically inactive, stable, and produce minimum foreign body reaction. It should maintain its size and shape, be light in weight, easily removed, and most important, it should be elastic.

Following the favorable report on Ivalon by Grindlay and Waugh, which suggested that it approached the above criteria better than any material previously used, the authors undertook to repeat their experiments. They also compared the reaction produced by Ivalon with other agents commonly buried in body tissues.

Their findings corroborated those of the Mayo group. When the sponge was placed intrapleurally it became adherent to the visceral and parietal pleural surfaces in the form of a thin layer of mesothelial tissue. On palpation the sponge had an India-rubber consistency.

The polyvinyl sponge, if pure, is white in color, odorless, and tasteless, and the cut surface presents the appearance of a piece of white bread. It is quite tough, and when dry becomes hard. When moistened it becomes very soft, flexible, and elastic. It is very easy to cut with scissors when soft. It is light in weight when dry, with a density of 0.05. The sponge absorbs water freely, increases in size when saturated, and on drying there is slight shrinkage.

Fifty cases of lobectomy, pneumonectomy, and segmental resection are reported in which the polyvinyl sponge was used as an intra- and extra-pleural plombage.

By utilizing this type of prosthesis, the dead space created following resection is filled and accompanied by a minimal amount of reaction. This prevents the overexpansion of the remaining lobe or lobes on the operated side. Thoracoplasty, heretofore necessary to accomplish this, is eliminated, and the contour and functional integrity of the thoracic cage are preserved.

It is possible to complete the procedure in one stage. If this is not advisable and a second operation is necessary to insert the sponge, it is simpler and less shocking than a thoracoplasty. The authors believe that in those cases where further resection is necessary on the opposite side, the patient will be a better operative risk with an intact thorax and without overdistention.

As more is learned about the new drugs and their therapeutic use in tuberculosis, the amount of lung tissue which has to be sacrificed at operation will be greatly decreased. During the past year the authors performed 200 resections for tuberculosis, and 48% were of the segmental type. Many of these consisted of the removal of such small segments that any type of fill was unnecessary. But for these changing trends this series would have been larger. Until 1 year ago the authors found that in over 400 resections approximately 95% were lobectomy or pneumonectomy.

Any foreign material placed in the body is not ideal and will always have disadvantages. If these are minimal when compared to the beneficial effects, as demonstrated in this small group of cases, the use of this procedure is justified. (J. Thoracic Surg., Dec. 1952, J. W. Gale, A. R. Curreri, W. P. Young, and H. A. Dickie)

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#### Torsion of Spermatic Cord

The most striking symptom of torsion of the spermatic cord is the sudden onset of severe, unrelenting testicular pain. The pain is usually well localized, but may radiate to the groin or flank. Unlike the pain in inflammatory conditions of the intrascrotal contents, it is not relieved by elevation of the scrotum (Prehn's sign). The pain is so severe that medical attention is sought immediately. In the author's experience, this was an important consistent finding. There may be nausea and vomiting. The temperature is slightly elevated or normal. There is marked prostration, seemingly out of proportion to the pathologic process.

The course of this disease is divided into an early and late stage upon which is based the differential diagnosis and treatment. If the testis is to be saved, diagnosis and treatment must be made in the early stage, before the later changes are apparent.

In the early cases, the local changes are few. The involved testis is high in the scrotum and is exquisitely tender, making palpation impossible. Ewart and Hoffman mention abnormal position of the epididymis, which is normally posteromedian to the testis, this relation changing according to the degree of torsion observed.

A past history of one or more episodes of testicular pain is frequently given. In the intermittent type of torsion, the pain is severe, lasting 5 to 30 minutes, and is accompanied by tenderness. It subsides rapidly without treatment. This is caused by recurrent torsion, which resolves itself spontaneously.

The changes observed in the late stage are caused by infarct necrosis of the testis and epididymis. The skin of the scrotum becomes edematous and reddened. The scrotal content are markedly enlarged, confluent, and adherent to the scrotal wall. The pain subsides gradually over a period of



several days, and mild tenderness remains, being much less noticeable than in the usual case of acute epididymitis. Many of the authors' patients were in this stage when first seen. The diagnosis was made from the history, because the physical findings were indistinguishable from those in other inflammatory conditions. If epididymo-orchietomy is not done, atrophy will occur.

The problem of differential diagnosis varies with the stage of the disease. In early cases, before local change other than tenderness follow the sudden onset of extreme pain, torsion of the hydatid of Morgagni and trauma must be considered; with the former, the tenderness is localized at the upper pole of the testis, and with the latter, there is a history of injury. As tumefaction, redness, and edema ensue, acute epididymitis, tumor, strangulated inguinal hernia, chronic epididymitis, spermatocele, hydrocele, and orchitis must be considered. This history of sudden onset of pain is the main differential point. If these conditions are found upon exploration of the scrotum for suspected torsion, little is lost, because most of them are surgical emergencies.

This condition constitutes a true surgical emergency. Early diagnosis and prompt surgical treatment are mandatory. All too often, patients are merely given morphine and observed during the critical hours when the testis could be saved. (New England J. Med., Dec. 18, 1952, J. S. Wheeler and F. B. Clark)

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### Tumors and Hyperplasia of the Parathyroid Glands

Since 1935, many cases of primary hyperparathyroidism have been reported primarily from the clinical or surgical viewpoint, but detailed pathological studies on the subject have been few in number. This paper summarizes the pathological findings in the parathyroid glands of 140 patients who had primary hyperparathyroidism and who were seen at the Mayo Clinic up to December 31, 1951. Detailed descriptions of the pathological changes in some of these cases have been reported previously.

The material for study consisted of tumors of the parathyroids or hyperplastic glands obtained by surgical removal in 137 cases, and at necropsy in 3 cases. All gross specimens were available for study. Multiple paraffin sections from each specimen were stained with hematoxylin and eosin. All cases were considered to be proved examples of primary hyperparathyroidism.

This study was based on the 140 cases of primary hyperparathyroidism; a single adenoma was present in 115, multiple adenomas or adenomatosis in 11, primary water-clear hyperplasia in 12, and carcinoma in 2. Single hyperfunctioning adenomas in this series varied in size from 101 gm. to approximately 25 mg. Some gross relationship was evident between the size of adenoma and the degree of hyperfunction. Histologically, adenomas may be composed of small or large chief cells, transitional water-clear cells,

wasserhelle cells, or oxyphils. Approximately two-thirds could be classified according to a dominant cellular type, and the remainder showed mixtures of several or all types of cells. The chief-cell adenoma was the commonest type. Five single wasserhelle adenomas were noted. These may be confused histologically with primary water-clear hyperplasia. Three hyperfunctioning adenomas were composed almost entirely of pale oxyphile cells. Fourteen well-encapsulated adenomas displayed great cytological irregularity and contained many giant nuclei. These were all benign clinically. Five cases of primary hyperparathyroidism were associated with hypoglycemia, and there was a proved tumor of the pituitary gland in 3 of these cases. In this syndrome, involvement of multiple parathyroid glands was a constant finding. The changes in the parathyroids in certain of these cases suggested a primary nodular hyperplasia rather than formation of a true tumor.

In 12 cases of primary water-clear hyperplasia, the weight of hyperplastic parathyroid tissue removed surgically varied from 52.5 gm. to 760 mg. Two, three, four, or more masses of parathyroid tissue may be found in the neck.

The histological picture in most cases of primary hyperplasia is uniform throughout, only large water-clear cells being present. In exceptional cases, an admixture of smaller clear cells or a few chief cells may be found. Histologically, primary hyperplasia may be separated readily from secondary hyperplasia of the parathyroids. Carcinoma of the parathyroids is rare. In one case in this series, recurrence and metastasis occurred. The tumor in the second case was classified as carcinoma on the basis of invasion of adjacent structures. No recurrence or metastasis has taken place to date. (Cancer, Nov. 1952, L. B. Woolner, F. R. Keating, Jr., and B. M. Black)

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### Training and Employing Handicapped Workers

The successful use of the physically handicapped in industry involves a number of problems. The potential employee may often have become handicapped well along in life; or be so mentally discouraged as to lack the necessary will to do.

Although the author's company (Northrop Aircraft, Inc.) had used a small number of handicapped individuals in their operations prior to World War II, as is the case with most large employers, their interest in this program was greatly stimulated by their experiences during the war years when it was difficult to find sufficient personnel to accomplish the tasks assigned by the Defense Department. At that time circumstances directed their work along two lines, the first of these being the practical solution of problems inherent in the employment of the severely handicapped, which were encountered in building up necessary manpower. The second interest centered in the improvement of prosthetic devices in an effort to qualify for useful work those previously considered unemployable.



The most interesting and unique experience involved their operations at the Birmingham General Hospital at Van Nuys, Calif. In that institution, peopled by those considered too ill mentally or physically for discharge to their homes, a successful workshop was operated. Even some bed patients were given small but useful tasks and were paid for their accomplishments at the same rates received by men in the factory doing similar work. The therapeutic values, both mental and physical, of this return to active and useful employment were amazing.

Under the careful supervision of the hospital physicians, men with all sorts of disabilities were assigned 1 to 4 hours of daily work on tasks for which they were best fitted. Patients unable to leave their beds were able to make small assemblies, sort out scrambled but still valuable bolts, nuts, and rivets from salvaged sweepings, and put together simple wiring harnesses for later inclusion in more complex assemblies at the plant.

Those in wheel chairs, or those able to get about a bit with the use of crutches, were given bench jobs. Hand finishing of parts, the completion of small assemblies, simple machine-shop activities such as drilling, burring, polishing, and bending all proved entirely suitable for the average ambulatory patient. Of course, special provisions had to be made for special cases. Men with only one hand ran drill-press operations by means of extemporized footpedal attachments. Special simple jigs and fixtures were provided to particularly fit the needs of the employee-patients.

The work turned out was good on any comparative basis. Job for job, the production rate was as good as achieved in the main factory by nonhandicapped employees. There seemed to be something almost magically curative in the realization by the hospitalized individual that he was again actively contributing to the war effort and earning a proper reward in the realistic coin of the realm.

In the treatment of the wounded, psychological factors seemed to be just as important as physical ones. Some of the most surprising results were obtained with individuals who were completely listless, or actively antagonistic to normal curative therapy. Men who were considered very ill were returned to a normal mental condition through the simple process of providing them with useful jobs and paying them for their work. The advantages of this type of rehabilitation were twofold. The patient not only seemed to recover more rapidly when contributing usefully to the economy of the Nation, but was better fitted to find employment after his discharge from the hospital. Many of these veterans were employed by the company after they were discharged from the services, with excellent results.

The author does not wish to leave the impression that the operations at Birmingham would have been practical without the close cooperation of the hospital staff. Neither is he of the opinion that the average hospitalized veteran could be taken directly into industry and given a job. His point is that with care in fitting the job to the man, and with sincere interest on the part of the employer, miracles can be achieved in the rehabilitation of the handicapped.

The activities mentioned to this point are related to the main subject but do not apply directly to the principal interest, namely: First, how does a large manufacturing concern successfully integrate the handicapped into its operations; and second, how profitable is this operation from a purely business standpoint?

According to a recent survey, about 2,000 of Northrop Aircraft personnel are handicapped. Included in this group are the blind, the deaf, paraplegics, amputees, those suffering from cardiac ailments, and almost every other nontransferable physical disability.

The first essential to the large-scale employment of such people is a genuine interest on the part of top management in the success of the program. It makes no difference whether this interest stems from humanitarian motives or from an urgent need for added manpower. It is only essential that management impress upon its medical department, as well as its general supervision, the idea that, as a company policy, handicapped persons are to be used wherever possible. It then becomes necessary for the medical department to spend enough time with each handicapped applicant to fully analyze his abilities and disabilities, and to give time and thought, in cooperation with the personnel department, to the proper placement of the individual concerned.

Much harm can be done by overestimation of a handicapped worker's ability to perform a given task. In this evaluation a plant medical director plays an important role. Working with the personnel department a close estimate must be made of the physical ability of the new employee. It is important to be as sure as possible that the new man or woman will be happy and reasonably successful on the first assigned job.

It is better to underestimate than to overestimate capabilities in the early training and adjustment period. Common sense indicates that a blind man should not be put to work operating a high-precision machine at first, that an amputee should not be employed in a job requiring frequent and active movement from place to place, and that the deaf cannot perform effectively where proper performance depends upon oral direction.

Supervision must have a friendly attitude during the necessary period of indoctrination, without resort to expressed sympathy or overindulgence, and continual surveys are necessary to ascertain if the placement is successful.

The blind people have done especially fine jobs. Some perform highly skilled work, and their supervisors have commended them again and again. Based on merit alone, they have received repeated increases in pay and repeated increases in responsibility. The technical abilities of the blind are often very surprising to those inexperienced in their employment. It is a well-known fact that their other senses develop far beyond the proficiency normally achieved by the average person. They are able to make highly complicated electrical, hydraulic, and mechanical assemblies with a lower rate of rejection and a higher rate of production than the average employee. They have often completed thousands of production hours without the loss of a single minute due to an industrial mishap. These people do not ask for,



or need, any sympathy. They want only an opportunity to prove their ability and willingness to do a good job, and thoughtful consideration on the part of the employer and his supervisor in the proper selection of suitable jobs and in the somewhat prolonged training period.

Although it has been believed for many years that the handicapped personnel are at least on a par with the unimpaired employees, the company only recently made a factual study. This study in effect matched impaired and unimpaired people under conditions as nearly identical as possible. Comparative performance was recorded of individuals in the same age and experience group, doing the same kind of work under similar conditions. The record revealed that impaired individuals consistently performed in a manner equal to, and in some respects better than did unimpaired personnel. Handicapped people were found to be more regular in their work attendance than the unimpaired. They were found to have a better record with respect to nondisability-on-the-job injuries, and their production rates were as good or better than average.

The company's initial interest in this whole subject was largely humanitarian, for at that time few managements had seriously considered it from a business standpoint. However, they found that the employment of the physically handicapped, when properly matched to the job and properly trained for the job, is just plain good business.

Although the work of their handicapped people speaks for itself and they are writing their own tickets to success, great credit must be given to the interest being created among industrialists and others in this Nation through the annual "National Employ the Physically Handicapped Week." Through the work of the President's Committee and the diligent effort of its executive officials on Federal, State, and local levels, the public has become more conscious of the great potential value of the thousands of capable handicapped persons in this country.

If this program is carried to its maximum effectiveness by individual industries through the coordination of organizations such as this Committee and the State and local committees, everyone will benefit. The handicapped will be able to carry their heads high, industry will have a valuable source of manpower to draw on, and each community will have absorbed into its economic life outstandingly loyal citizens who have already demonstrated our American brand of courage by bearing their personal crosses without surrender and without complaint. (Occupational Health, Jan. 1953, J. K. Northrop)

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The printing of this publication has been approved by the Director of the Bureau of the Budget, June 23, 1952.

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### Obstacles to Eradicating Congenital Syphilis

Congenital syphilis is one of the most completely preventable of all serious diseases. Its epidemiology and pathogenesis are so thoroughly understood and available methods of prevention, diagnosis, and treatment are potentially so excellent that eradication seems to be a practical goal.

There has been much progress toward this goal. In fact, Nelson and Struve, on the basis of a careful study in Baltimore, concluded that the number of infants born with syphilis probably cannot be reduced any further—until there is less syphilis among adults or until more mothers seek and obtain early prenatal care.

This conclusion may be applicable to many communities. However, it is likely that in others the effectiveness of control activities aimed directly at congenital syphilis could be improved relatively cheaply. For this reason a brief review of the general problem seems indicated.

Penicillin treatment of pregnant women is extremely effective in the prevention of congenital syphilis. Once adequate treatment has been received it is no longer considered necessary to re-treat the mother during every pregnancy, if she can be followed closely.

Diagnosis of syphilis in infancy is often difficult. There may be no physical signs of the disease. The serologic test for syphilis (STS) is often negative until 3 or 4 months of age. On the other hand, nonsyphilitic infants of syphilitic mothers (usually with treated or old infections) may be seropositive from birth until 3 months of age because of transplacental transfer of maternal reagin. Nonsyphilitic infants also may develop biological false positive serologic tests during the fifth month of life or after. This is thought to be caused by an immunization procedure or an acute infection. Penicillin is the agent of choice for the treatment of congenital syphilis. The patient is more likely to become seronegative if he is treated before age 2 and preferably in the first 6 months of life. Interstitial keratitis remains a difficult complication to prevent or to treat. Recently cortisone has been used as an adjuvant in treatment.

Weakness of control programs can be studied by reviewing histories of recently treated cases and tabulating all control opportunities which were missed prior to diagnosis, a technique that could also be modified for use in the study of other venereal disease control problems.

Using this technique, a careful study was made of 60 cases of congenital syphilis brought to treatment in a 4-county area in North Carolina.

Judging from this series of cases, it was expected that more emphasis was needed in many communities on the following activities: 1. Making the initial step of detecting a case of syphilis in a family. 2. Following the chain of infection until all infected family members are located. 3. Keeping the family under observation until the possibility of future congenital infections was eliminated and any child already infected was treated.



The actual process of administering antisyphilitic treatment to infected mothers or children presents only minor problems today.

In some areas, many women still go through pregnancy and delivery without being given a serologic test for syphilis, despite laws requiring this procedure.

Mothers may be infected late in pregnancy with resultant infection of the fetus. This dangerous possibility may be overlooked if an earlier prenatal STS was negative.

Fragmented, poorly integrated health and medical services to syphilitic families appear to present a basic problem to which there is no ready or certain solution. (Pub. Health Rep., Dec. 1952, J. J. Wright, C. G. Sheps, E. E. Taylor, and A. J. Gifford)

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### Sylvan Yellow Fever

The main front of a wave of sylvan yellow fever which originated in eastern Panama in 1948 has advanced westward across Panama, northwestward through Costa Rica, and northward into southeastern Nicaragua to an active epidemic center 45 miles northeast of Lake Nicaragua in the Department of Chontales having moved 580 miles in 44 months.

An epizootic area in the northeastern section of the Province of Guanacaste, Costa Rica, extending from Arenal Lake to San Juan del Sur in the Isthmus of Rivas, threatens the Pacific coast of Nicaragua.

A secondary wave in southwestern Costa Rica, detected in October, 1951, has not advanced into the Pacific watershed of Panama, and its northwestern front is now in the vicinity of Parrita-Quepos.

Because the main wave is expected to continue its advance northward through Nicaragua and westward through northern Honduras to Guatemala and Mexico through a terrain funnel in the vicinity of La Ceiba, Honduras, a project is presented in an effort to block the progress of the wave in this region before July 1954.

As the front of the main wave moves northward into the long valleys of eastern Nicaragua many eventualities must be anticipated and the problem of maintaining contact will become more complicated. Honduras and Nicaragua should coordinate efforts to maintain a constant alert for penetrations of the central mountain mass by both epizootic and epidemic episodes. Many of these penetrations will probably fail to cross the highlands, but some might do so. Precision alone will prevent the development of chaos and confusion, and the necessary precision can be maintained only by a systematic acquisition of human and monkey livers for histologic examination. Probably by July 1953, the country of the Mosquitia Indians in the valley of the Rio Coco, in northeastern Nicaragua, will be invaded. The events of the next 15 months will determine the feasibility of the La Ceiba project.

Multimillion dollar public health projects of limited success, but usually resulting in constructive reorientation are not unique undertakings in contemporary world organization. Only trial and error can determine their potentialities. Much is at stake for the farming population of Central America and Mexico as the wave front of sylvan yellow fever continues on its inexorable pathway. The only hope of arresting its progress lies in an attempt to establish a barrier zone with effective insecticides and adequate control studies at some point where a terrain funnel of small enough size can be found between its present location and its future zones of activity. Careful study of aeronautical charts and terrain maps indicates that the most likely place where this could be done is in the vicinity of La Ceiba in northern Honduras. Here there is a narrow strip of coastal rain forest, a range of mountains (Cerros de los Andes) and the valley of the Rio Aguan, where a transecting strip of terrain about 35 miles in length and from 5 to 10 miles in width, running southeast or southwest across these terrain features, could be utilized as a barrier zone.

Reconnaissance of this area would undoubtedly demonstrate that the entire strip would not require intensive treatment with DDT or other insecticides, but only those parts of it capable of transmitting the epizootic. An outline of this project has already been published. At the present rate of progress of the wave this region should be involved in about 2 years (July 1954), subject to revision as necessitated by further developments in Nicaragua. There is still ample time for consideration and planning. If this region is successfully blocked, but by-passed by the wave, then "jungle Yellow Jack" will in due time claim many more victims in Honduras, Guatemala, British Honduras, and Mexico. If an attempt is made to block the wave, even without success, much will have been learned for having made the effort; but if no attempt is made to establish this barrier zone then the grim mechanism will continue to advance unchallenged. (Am. J. Pub. Health, Dec. 1952, COL. N. W. Elton, MC, USA)

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#### Course of Instruction in Aviation Medicine

A new class in Aviation Medicine will convene at the U. S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla., on 6 April 1953. The course is of approximately 6 months' duration and candidates successfully completing the course will be designated as U. S. Naval Flight Surgeons.

The class will be limited to 32 medical officers of the Regular Navy and Reserve of the rank of Lieutenant Commander and below. There is an urgent need for Flight Surgeons in the air arm of the United States Navy and all eligible medical officers are requested to consider this new and growing field of medicine as a specialty for their naval career.

Aviation Medicine offers to the medical officer diversified opportunities for naval medical experience. Duty with aviation units afford general medical



practice in addition to special opportunities for practice in otolaryngology, ophthalmology, physiology, psychiatry, as well as research and other specialty fields.

Those medical officers desiring to enroll for this course should apply by official correspondence to the Chief of the Bureau of Medicine and Surgery, Aviation Medicine Division, and include in the request the following agreement of obligation: "I agree to remain on active duty for 1 year following completion of the course or for 6 months beyond my obligated service, whichever is longer." (Av. Div., BuMed)

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#### From the Note Book

1. "We must drive home the point that there is still a third side of medicine. We are going to have to learn to practice not only the science and art of medicine, but the citizenship of medicine. We are going to have to do away with the notion in some doctors' heads that to be a citizen is to be a medical politician, which is a very very bad thing. We must bridge the gap between the specialist and our general practitioners. When we reach the point that our specialists and our various allied associations and the many scientific meetings over the state are all tied together to one common end, and that end the welfare of American medical practice, then surely we will have reached Nirvana insofar as the health care of our people is concerned." T. C. Terrell, M. D. President, Texas Medical Association, Missouri Medicine, Jan. 1953.

2. A joint activity co-sponsored by the Texas State Department of Health and the University of Texas Dental Branch enabled 75 Texas dentists to participate in the annual short course on mouth cancer at the University of Texas on 10 and 11 Nov. 1952. They were selected by their local District Dental Society, 1 dentist for every 25 members or major portion thereof. (P. H. S. Cancer Control Letter, 31 Dec. 1952)

3. In Los Angeles, Calif. a new monthly periodical called Occupational Health News is being written for industrial physicians, engineers, and nurses. The October issue included articles on radiological health, dermatitis in industry, sanitary maintenance, and other pertinent subjects. (F. S. A., P. H. S. Occupational Health, Jan. 1953)

4. A brief synopsis dealing with the author's experience in the handling of burns in the Korean Theater appears in Treatment Services Bulletin, Dept. of Veterans Affairs, Ottawa, Ont., Canada, Dec. 1952, MAJ. A. M. Davidson, R. C. A. M. C.

5. A simple and rapid turbidimetric procedure for the determination of dextran in serum and urine is described in Journal of Laboratory and Clinical Medicine, Dec. 1952, W. Metcalf and L. M. Rousselot.

6. A study was made of 123 verified cases of neoplasms of the reticulo-endothelial system in which visceral manifestations were present. The data indicate that any viscus may be involved by the neoplastic processes of disease. (Cancer, Nov. 1952, S. P. Lucia, H. Mills, E. Lowenhaupt, and M. L. Hunt)

7. Irradiation of recurrent and metastatic breast carcinoma is, in general, more effective than the primary use of the steroids so far employed, particularly in premenopausal women. The use of androgenic steroids for premenopausal patients should be reserved for those with involvement too widespread for roentgen therapy and for radio-resistant processes. (Am. J. Roentgenol., Dec. 1952, I. MacDonald, F. E. Davis, and G. Jacobson)

8. The December 1952 issue of Public Health Reports presents an article by Dr. Jack Masur on "Establishing Housing Standards for the Aged" and a report by Mr. Irving Ladimer on "Housing and Health Facilities for our Senior Citizens."

9. The National Bureau of Standards is investigating the feasibility of detecting incipient failures of electronic equipment long before they perceptibly affect over-all performance. (N. B. S., T. N. B., Dec. 1952)

10. A method has been devised and a technique developed to replace portions of the esophagus with a special plastic tube in the treatment of carcinoma of the esophagus. (J. Internat. Coll. Surgeons, Nov. 1952, E. F. Berman)

11. Myxomatosis as a method of biological control against the Australian rabbit is discussed in American Journal of Public Health, Dec. 1952, Sir F. M. Burnet.

12. A discussion of the complications and the results of treatment of bronchopleural fistula following resection for tuberculosis appears in Journal of Thoracic Surgery, Dec. 1952, J. D. Murphy, B. B. Becker, and H. V. Swindell.

13. Naval medical officers recently certified in their specialties are: CDR. J. T. Giannini, MC, USN, American Board of Plastic Surgery; LCDR. James R. McShane, MC, USN, American Board of Internal Medicine.

14. The Bureau of Medicine and Surgery's training film "Sciatic Pain and the Intervertebral Disc", was the most popular film presented at the December 2-5, Denver Session of the American Medical Association. (TIO, BuMed)

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BUMED INSTRUCTION 6820.5

23 Dec 1952

From: Chief, Bureau of Medicine and Surgery  
To: All Ships and Stations Having Medical Department Personnel  
Regularly Assigned

Subj: Pharmacy Reference Library

1. This instruction provides a list of books for a pharmacy reference library, considered desirable for ships and stations having prescription services. BuMed Inst. 6820.2 of 6 Oct 1952 is cancelled.

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BUMED INSTRUCTION 5700.1

29 Dec 1952

From: Chief, Bureau of Medicine and Surgery  
To: Naval Hospitals, Hospital Ships, and Stations Having  
Medical Officers Attached

Subj: Red Cross activities in the Naval Medical Department

Ref: (a) Art. 3-37, ManMedDept  
(b) Art. 21-25, ManMedDept  
(c) Ch. 23, Sec. VIII, ManMedDept  
(d) Art. 25-11 ManMedDept  
(e) Appendix A, ManMedDept

1. This instruction provides information and consolidates directives, in addition to references, concerning the American National Red Cross and the Naval Medical Department.

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BUMED NOTICE 6310

29 Dec 1952

From: Chief, Bureau of Medicine and Surgery  
To: All Hospitals and Hospital Ships

Subj: NavMed-F reports for 1952; completion and forwarding of

Ref: (a) Instructions Governing Individual Statistical Report of Patient  
(NavMed F) NavMed P-1313

1. This notice provides information for the completion and forwarding of 1952 NavMed F reports. It is desired that every effort be made to forward these reports and all others with January dispositions so that they will be received in the Bureau by 15 February 1953.

BUMED INSTRUCTION 1001.1

2 Jan 1953

From: Chief, Bureau of Medicine and Surgery

To: Commandants 1, 3, 4, 5, 6, 8, 9, 11, 12, 13 Naval Districts;  
Commandant PRNC; Commanding Officers, U. S. Naval Hospitals,  
Continental U. S.Subj: Utilization of Medical and Dental Officers of the Naval Reserve  
as Consultants in Naval Activities Without Pay; information onRef: (a) Tables of Organization for Naval Reserve  
(b) H5304 BuPers Manual, 1948 Revised  
(c) H5307 BuPers Manual, 1948 Revised

1. This instruction provides information relative to the utilization of Naval Reserve Medical and Dental officers as consultants in Naval activities, without pay. BuMed C/L 49-95 is cancelled.

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Permit No. 1048

OFFICIAL BUSINESS

WASHINGTON 25, D. C.

BUREAU OF MEDICINE AND SURGERY  
DEPARTMENT OF THE NAVYPENALTY FOR PRIVATE USE TO AVOID  
PAYMENT OF POSTAGE, \$300